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Statistics of Variations, with Remarks on the Use of this Method in Anthropology.

By THOMAS DWIGHT, M. D., LL.D.

Parkman Professor of Anatomy at Harvard University.

Origin of the Obturator Artery.

The following table shows the results of 500 observations on white adults; that is to say on 500 arteries of which a much greater number were in male than in female bodies, and a few more on the left than on the right side. The figures under I indicate those which arose from the internal iliac artery (A. hypogastrica), those under E, from the external iliac or its branches. The few under I + E had a double origin.

From	I	371	=	74,2	%
"	E	125	=	25,0	"
"	I + E	4	=	0,8	"

1895.

Adding this to the table given in SCHWALBE und PRITZNER's ¹⁾ recent publication, we find that this is the highest per cent of normal origins among the larger series, excepting JASTSCHINSKY's.

JASTSCHINSKY	404	cases	307	times	=	76,0	%
DWIGHT	500	"	371	"	=	74,2	"
CLOQUET	500	"	348	"	=	69,6	"
QUAIN	361	"	246	"	=	68,8	"
HOFFMANN	400	"	270	"	=	67,5	"
SCHWALBE und PRITZNER	359	"	241	"	=	67,1	"

Classified according to Sex.

Male.

	Number	I		E		I + E
Right	156	120 = 76,9	%	33 = 21,1	%	3 = 1,9 %
Left	171	128 = 74,8	"	43 = 25,1	"	0
Total	327	248 = 75,8	"	76 = 23,2	"	3 = 0,9 "

Female.

Right	87	61 = 70,1	%	25 = 28,7	%	1 = 1,1 %
Left	86	62 = 72	"	24 = 27,8	"	0
Total	173	123 = 71	"	49 = 28,3	"	1 = 0,5 "

This shows a larger proportion of abnormal origins among women, in accordance with other observers excepting JASTSCHINSKY.

Classified according to Side.

I Right.

		I		E		I + E
Male	156	120 = 76,9	%	33 = 21,1	%	3 = 1,9 %
Female	87	61 = 70,1	"	25 = 28,7	"	1 = 1,1 "
Total	243	181 = 74,4	"	58 = 23,8	"	4 = 1,6 "

Left.

Male	171	128 = 74,8	%	43 = 25,1	%	0
Female	86	62 = 72	"	24 = 27,8	"	0
Total	257	190 = 73,9	"	67 = 26	"	0

The comparison of the sides is more satisfactory than that of the sexes because the numbers are much more nearly equal. There is no difference in the totals worth noting. The largest percentage of abnormal origins is on the right side of women. QUAIN as well as SCHWALBE and PRITZNER find that this occurs on the left side of women; JASTSCHINSKY on the right side of men.

1) Morphologische Arbeiten, Bd. 3, Heft 3.

Among the 500 observations recorded above there are 400 which were made on both sides of 200 bodies (128 male and 72 female). It is worth while to compare the series.

From	I	289	=	72,25	%
	E	107	=	26,75	„
	I + E	4	=	1	„

Classified according to Sex.

		Male.					
	Number	I		E		I + E	
Right	128	96 = 75	%	29 = 22	%	3 = 2,3	%
Left	128	93 = 72,6	„	35 = 27,3	„	0	
Total	256	189 = 73,8	„	64 = 25	„	3 = 1,2	„

		Female.					
Right	72	51 = 70,8	%	20 = 27,7	%	1 = 1,4	%
Left	72	49 = 68	„	23 = 32	„	0	
Total	144	100 = 69,4	„	43 = 29,9	„	1 = 0,7	„

Classified according to Side.

		Right.					
Male	128	96 = 75	%	29 = 22,6	%	3 = 2,3	%
Female	72	51 = 70,8	„	20 = 27,7	„	1 = 1,4	„
Total	200	147 = 73,5	„	49 = 24,5	„	4 = 2	„

		Left.					
Male	128	93 = 72,6	%	35 = 27,3	%	0	
Female	72	49 = 68	„	23 = 32	„	0	
Total	200	142 = 71	„	58 = 29	%	0	

On the whole the two series do not differ very materially, with the exception of one point. The smaller series, in which both sides of every subject were examined shows that the left sides of women furnish decidedly the largest proportion of abnormal origins. It is clear that my female series is too small to give the true average.

The Relation of the Recurrent Laryngeal Nerve to the Inferior Thyroid Artery.

The first volume of the Anatomischer Anzeiger contains a small series of observations on this point, which is not included in the following series.

Number of observations	437
Artery in front in	226 = 51,7 %
Nerve „ „ „	157 = 35,9 „
Mixed	48 = 10,9 „
No artery	6 = 1,3 „

Classified according to Sex.

Male					
	Number.	Artery in front.	Nerve in front.	Mixed.	No artery.
Right	155	66 = 42,5 %	70 = 45,1 %	19 = 12,2 %	0
Left	139	84 = 60,4 „	32 = 23 „	21 = 15,1 „	2 = 1,4 %
Total	294	150 = 51 „	102 = 34,6 „	40 = 13,6 „	2 = 0,6 „

Female.					
Right	71	27 = 38,3 %	38 = 53,5 %	5 = 7 %	1 = 1,4 %
Left	72	49 = 69,4 „	17 = 23,6 „	3 = 4,1 „	3 = 4,1 „
Total	143	76 = 53,1 „	55 = 38,4 „	8 = 5,5 „	4 = 2,7 „

Classified according to Side.

Right.					
Male	155	66 = 42,5 %	70 = 45,1 %	19 = 12,2 %	0
Female	71	27 = 38 „	38 = 53,5 „	5 = 7 „	1 = 1,4 %
Total	226	93 = 41,2 „	108 = 47,7 „	24 = 10,6 „	1 = 0,4 „

Left.					
Male	139	84 = 60,4 %	32 = 23 %	21 = 15,1 %	2 = 1,4 %
Female	72	49 = 68 „	17 = 23,6 „	3 = 4,1 „	3 = 4,1 „
Total	211	133 = 63 „	49 = 23,2 „	24 = 11,3 „	5 = 2,3 „

The difference between the sexes is of no great importance. What is of most value is that on the left the artery is in front in nearly two thirds of the cases, and on the right in less than half. How to deal with the mixed cases, that is to say those in which the artery has a branch on each side of the nerve, and, more rarely when the nerve has a branch on each side of the artery, is very perplexing. I have adopted the principle of ignoring minute branches. If the smallest twigs were always counted the number of mixed cases would be much greater. It may be noted that the artery is absent only once on the right side and five times on the left.

The Division of the Abdominal Aorta.

	Males	Females	Total
Opposite 3 Lumbar V.	7 = 3,2 %	2 = 2 %	9 = 2,8 %
Disc between 3 rd & 4 th	6 = 2,7 „	5 = 5,1 „	11 = 3,5 „
4 th Lumbar V.	164 = 75,9 „	74 = 76,2 „	238 = 76 „
Disc between 4 th & 5 th	11 = 5 „	8 = 8,2 „	19 = 6 „
5 th Lumbar V.	28 = 12,9 „	8 = 8,2 „	36 = 11,5 „
Total	216	97	313

Of the 238 cases in which the division occurred opposite the fourth lumbar vertebra, in 50 it was at the top of the vertebra, in

34 at the middle, in 75 at the bottom, and in 79 the precise position was not noted. Of the 36 cases of division opposite the 5th lumbar vertebra, it was at the top in 32. In the other 4 the point was not noted.

It is unfortunately impossible to make a satisfactory comparison between these results and those of SCHWALBE and PFITZNER, as they apparently have not considered the intervertebral discs. Still as they find the division opposite to the top of the 5th lumbar vertebra in 20 % of their cases, and opposite some part of the 4th in only 73,3 %, it seems that with them the point of division is somewhat lower than in my series.

SCHWALBE and PFITZNER in their recent interesting¹⁾ work have compared their statistics with those of other observers and believe that some of the results are of anthropological significance. I incline to share this belief; but as some of the statistics used are of my collecting I feel bound to point out a source of error. These authors very justly lay great weight on the importance of learning the constancy of the averages, but they pass rather lightly over something which is absolutely essential to the matter: namely whether or not the material dissected at a certain place is sufficiently homogeneous to represent the population of that country. They give strong reasons for believing that the material at Straßburg is satisfactory in this respect, but they assume too readily that similar conditions prevail elsewhere. It is a very excusable, but still a grievous, mistake to suppose that the bodies dissected at Boston represent the population of Massachusetts. I cannot show this directly because I receive no statement of the nativity of my subjects. When I wish particularly to know it I have to resort to a rather troublesome correspondence. I can, however, prove it indirectly beyond reasonable doubt. Almost all the subjects used at the Harvard Medical School come from either the State Almshouse or a semi-penal institution called the State Farm. The others are so few that they may be neglected, and in fact are of the same class as the rest. In the last reports of these institutions there are tables giving the birth-places of the inmates admitted during the year ending September 30th 1893. I have added these together and reproduce what is essential.

1) loc. cit.

Number of admissions	4122
Born in the United States	1408 ¹⁾
„ „ Ireland	1459
„ „ England	366
„ „ Scotland	57
„ „ British Provinces	400
„ „ Germany	75
„ „ Italy	75
„ „ Russia	40
„ „ Sweden	32

This accounts for all but 210 composed of very small groups. But this is not the whole truth; for of the 1408 born in the United States there must first be deducted the negroes, who are excluded from my statistics. Their number is not given in the reports. I estimate it at perhaps 5% of the Americans. But what is more serious is that there is great reason to believe that the majority (I incline to think the large majority) of the natives are the children of foreign parents, mostly Irish. Hence it is evident that the number of subjects which can be said to represent the native population is extremely small. My statistics are more truly a contribution to Irish anthropology than to American. In fact I never intended to offer them as anthropological work. It is noteworthy, however, that 90 % (accurately 89,5+) of those admitted were born in Great Britain, its dependencies, and the United States.

The collective statistics of Great Britain and Ireland are, I am afraid, not more homogeneous. The subjects in Ireland are, no doubt, practically all Irish; those in Scotland are probably mostly Scotch, though Glasgow must contain many strangers; but I doubt very much whether the material in the dissecting rooms of London and of some other of the great English cities can be called distinctly English. If I am wrong I shall be glad to be corrected by some of our English colleagues. The Russian statistics are, no doubt, far more satisfactory.

There are four series in which SCHWALBE and PFITZNER claim to have found differences enough marked to have an anthropological significance. Of these the most satisfactory to me both on account of the large number examined and the source of the material is the one showing the absence of the palmaris longus in 12,7 % at St. Petersburg, and in 20,4 % at Strassburg.

Very striking is the remarkable difference of frequency of the

1) Of these 950 were born in the New England States, and 178 in New York State.

"candleabra" division of the carotid at Strassburg and Breslau, being 20 % in the former and 60 % in the latter.

The average absence of the pyramidalis is very different in the Strassburg and the Boston dissecting rooms. I incline to believe that it may be a characteristic of race; but the race my observations represent is not that of Massachusetts.

Finally we have the absence of the psoas minor which is particularly interesting.

GRUBER	1500	cases	absent	in	48,7	%
SCHWALBE & PFITZNER	561	"	"	"	56,7	"
DWIGHT	608	"	"	"	60,5	"
English Anat. Society	914	"	"	"	64,3	"

This is perplexing; for all the numbers are reasonably large. My material should not be very different from that of the English anatomists. Why is it that the average is half way between those of England and Strassburg? Is it because thousands of observations are necessary for a true average, or that the material both in America and Great Britain is not sufficiently homogeneous? Whatever may be the truth about the first alternative, I believe that the latter gives a sufficient explanation. One thing is certain, namely that the Russian results differ widely from all others.

I hope it is needless for me to say in conclusion that nothing is further from my purpose than to disparage the work of Professors SCHWALBE and PFITZNER. On the contrary it is because I appreciate so highly its value and the scientific spirit in which it is conducted that I am anxious to point out what seems to me a source of error.

Boston, Harvard Medical School,

Aug. 13th 1894.

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